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J. P. SNEDDON.

LANTERN PLUG.

APPLICATION FILED JAN. 24, 1903.

NO MODEL.

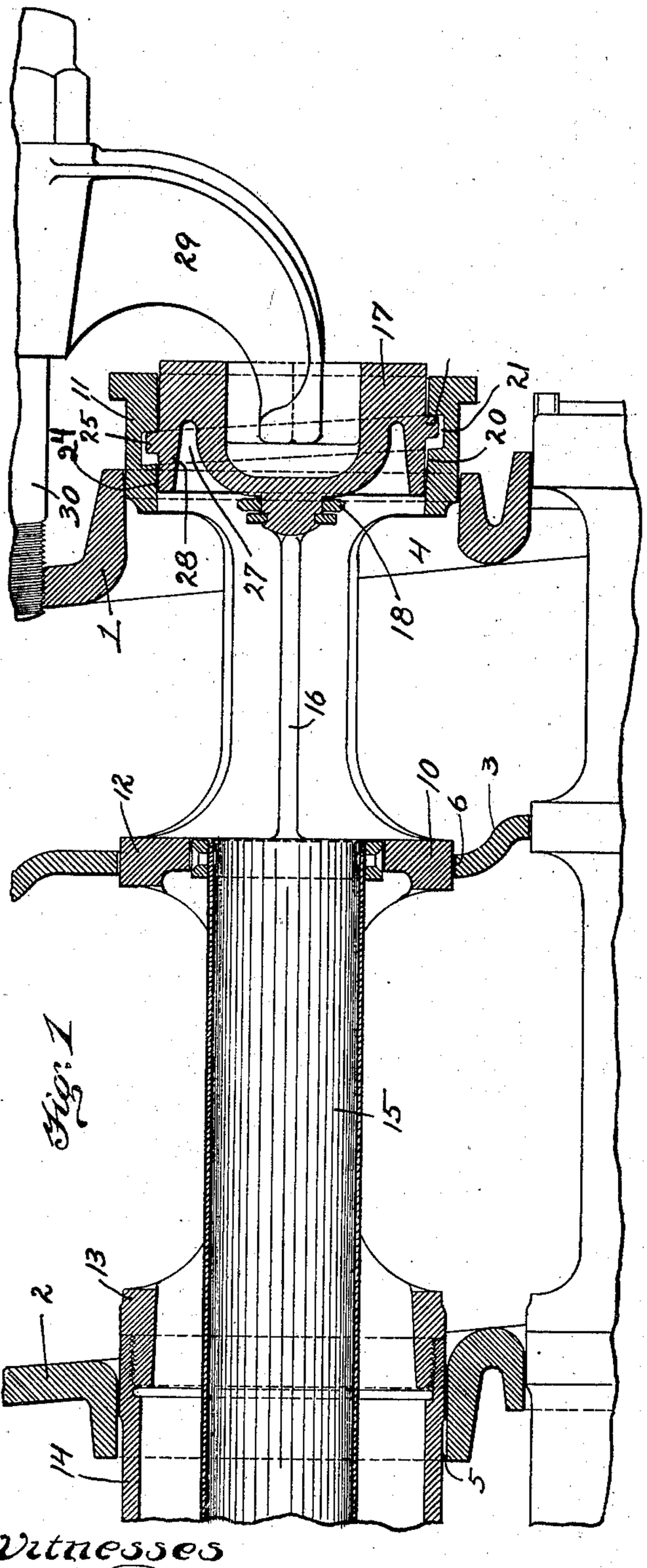

Fig. 1

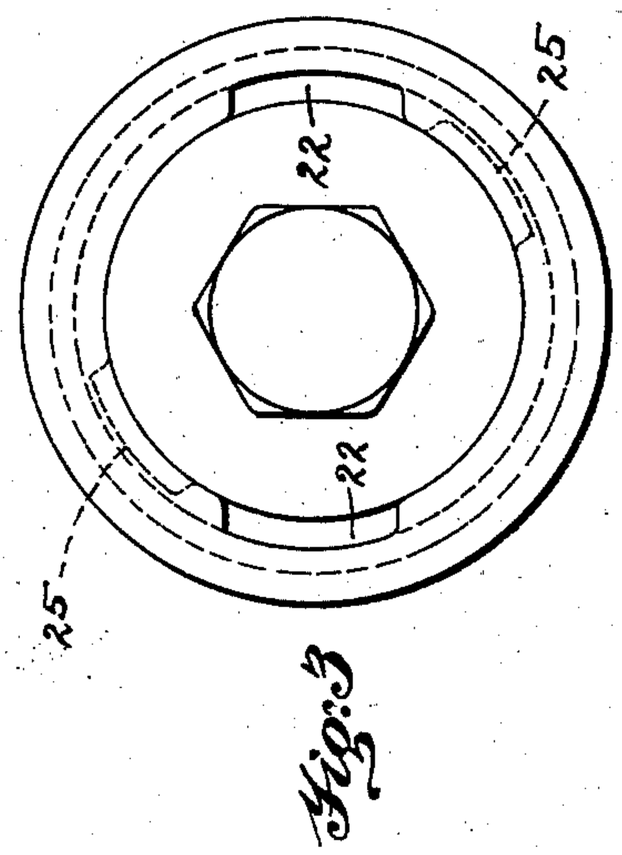

Fig. 3

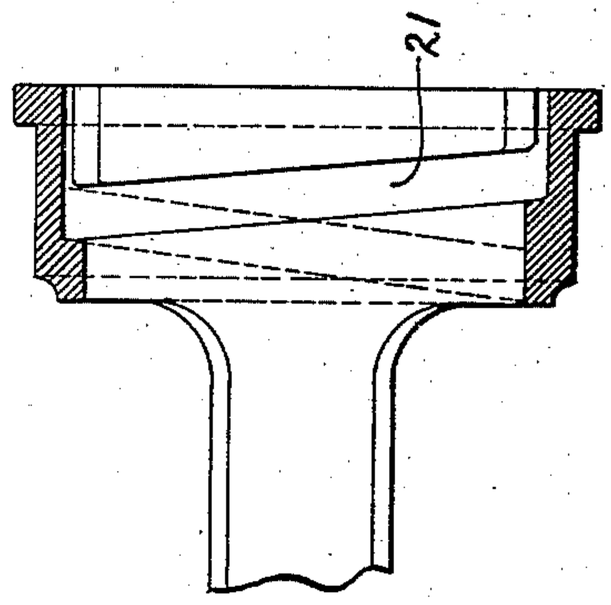

Fig. 2

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No. 749,807. Patented January 19, 1904.

UNITED STATES PATENT OFFICE.

JAMES P. SNEDDON, OF BARBERTON, OHIO, ASSIGNOR TO THE STIRLING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

LANTERN-PLUG.

SPECIFICATION forming part of Letters Patent No. 749,807, dated January 19, 1904.

Application filed January 24, 1903. Serial No. 140,349. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. SNEDDON, a resident of Barberton, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Lanterns and Lantern-Plugs for Niclausse Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to Niclausse and similar water-tube boilers, and more especially to the lantern and lantern-plug. Its object is to provide a lantern or outer tube and a lantern-plug so constructed that they can be readily assembled and taken apart and still form a perfectly tight joint.

The well-known Niclausse water-tube boiler has a series of headers each of which is provided with a diaphragm dividing the same into two longitudinal chambers one behind the other. The front and rear walls of the header and also the diaphragm are provided with alining openings, and in these openings are placed skeleton frames or "lanterns," as they are called, which form tight joints and close the openings in the header-walls and are adapted to have the outer tubes connected to their rear ends. These tubes, as is well known, are closed at their rear ends, and in them are located the inner or circulating tubes, having their rear ends open and extending nearly to the rear closed ends of the outer tubes. The forward end of each inner circulating-tube extends into the lantern as far as the diaphragm of the header and is there connected to a frame, which in turn is provided with or attached to a plug secured in a collar at the front end of the lantern. The usual way of connecting the plug to the lantern is by threading the former into the latter.

The object of my invention is to provide an improved lantern-plug and lantern or outer tube so constructed that they can be quickly and easily assembled or taken apart and which will nevertheless form a tight joint.

To these ends it consists, generally speaking, of a lantern of the usual or any desired construction or an outer tube having its forward end formed as a lantern, said lantern or tube having a spiral groove or grooves cut in the inner face of the forward end thereof, which groove or grooves run out to the outer face of the lantern or outer tube or have intersecting grooves running out to the outer face, together with a plug provided with a projection or projections adapted to enter said spiral groove or grooves, and which when the plug is rotated will force the latter inwardly against a seat in the lantern.

The invention also consists in providing the lantern with a conical seat against which the plug will bear when forced inwardly, thus making a water or steam tight joint.

It also consists in forming a groove or recess in the rear face of the plug into which the steam-pressure will enter, thus forcing the annular wall or shell surrounding said recess outwardly into firm contact with the seat in the lantern or outer tube and insuring an absolutely tight joint.

In the accompanying drawings, Figure 1 is a vertical section through a portion of the header and my improved lantern and lantern-plug. Fig. 2 is a section through the forward part of the lantern, and Fig. 3 is a front view of the lantern with the plug in place.

The front wall of the header is shown at 1, the rear wall at 2, and the diaphragm at 3. These walls and diaphragm are provided with alining openings 4, 5, and 6, respectively. The openings 4 and 5 in the header-walls are provided with slightly-conical seats tapering from the front toward the rear. In these alining openings is the skeleton frame or lantern 10, which is or may be of the usual construction, that shown being provided with the collar 11 at the forward end, making a close fit on the seat in the opening 4, a collar 12 opposite the diaphragm, but not necessarily making a close fit in the same, and a rear collar 13, to which is attached in any suitably way, as by being threaded thereon, the forward end of the outer water-tube 14. Either the rear collar 13 or the forward end of the tube 14 makes a close fit with the seat in the opening 5.

Inside of the tube 14 is the inner or circulating tube 15, which extends into the header and lantern as far as the diaphragm 3. At

this point it is connected to another skeleton frame 16, which at its forward end is provided with or attached to a plug 17. The latter may, if desired, be an integral portion of the frame 16; but it is preferred to make the same separate therefrom, as indicated, and attach the same to said frame by means of a swivel connection 18, so that the plug can rotate independently of the frame and inner circulating-tube.

All of the parts of the header and inner and outer circulating-tubes may be of the usual or any desired construction, and the lantern and plug also may be of any desired construction and differ from those usually employed only in the particulars now to be described.

The forward collar 11 of the lantern 10 has a slightly-conical seat 20 formed on its inner face, the taper being toward the rear. Cut into the inner face of said collar is a spiral groove 21, which resembles in section a square thread. This spiral groove either runs out to the forward face of the collar or communicates therewith by means of one or more longitudinal intersecting grooves 22, two such grooves being shown. The groove 21 is shown as a continuous spiral, as will be clear from Fig. 2, in which one half of said groove is shown in full lines and the other half indicated in dotted lines. In place of this continuous spiral two or more separate spirals might be used, although for ease in cutting said groove the construction shown in the drawings is preferred. Any number of intersecting grooves 22 may be employed, two, however, being sufficient and preferable to a single one.

The plug 17 is provided with a face 24, which bears against the conical seat 20 when the plug is forced inwardly. Said plug is also provided with a projection or projections 25, corresponding in number to the grooves 22, two being shown, which projections will pass through the grooves 22 and enter the spiral groove 21 and on the rotation of the plug will ride along the spiral groove 21, thus forcing the plug inwardly. This rotation of the plug will continue until arrested by the face 24 coming into firm engagement with the seat 20 in the lantern. The projections 25 will be formed slightly on a spiral to correspond with the spiral trend of the groove 21. When a single spiral groove 21, as shown in the drawings, is used, one of the projections 25 will be placed somewhat farther from the forward end of said plug, as shown in Fig. 1. It will be observed that by giving the plug a partial rotation the face 24 thereof is forced into tight engagement with the conical seat 20 in the lantern, thus insuring a tight joint. To still further insure the tightness of this joint, the plug is provided on its rear end face with a groove or recess 27, cut to a considerable depth and so located as to leave a comparatively thin annular wall or shell 28 surrounding the same. In use the steam and water pressure will enter this groove or recess and expand the wall 28 outwardly against the seat 20, so that the greater the pressure in the boiler the tighter will be the joint between the plug and lantern.

Any suitable means may be employed for holding the plug and lantern in the header. I have shown for this purpose the usual yoke 29 and bolt 30, which will force the plug and lantern backwardly in the header and insure a tight joint between the lantern and the seats in the openings in the front and rear walls of the header.

The manner of constructing the plug and lantern and of assembling and disassembling the same will be readily understood from the foregoing description. The connection between the plug and lantern is such that they can be quickly and easily connected or disconnected, and it is not affected by rust or dirt, and at the same time an absolutely tight joint is provided.

It will be understood, of course, that certain modifications in the construction can be made without departing from the spirit of the invention. For instance, instead of having a single spiral groove 21 said groove might be formed in two or more separate sections. Instead of having a lantern separate from the outer tube 14 the forward end of said tube may be cut away and shaped so as to take the place of the lantern. The arrangement shown may be reversed—that is, the projections 25 may be formed on the inner face of the lantern-collar and the spiral groove 21 cut in the plug. All such modifications are considered to be within the scope of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In Niclausse and similar water-tube boilers, the combination of an outer tube or lantern provided at its forward end with a seat for the lantern-plug and having a spiral groove or grooves formed therein, and a plug adapted to have the inner circulating-tube attached thereto and provided with a face adapted to bear against the seat in the outer tube or lantern and provided with a projection or projections adapted to enter the spiral groove or grooves of the outer tube or lantern.

2. In Niclausse and similar water-tube boilers, the combination of an outer tube or lantern provided at its forward end with a conical seat on its inner face and having a spiral groove or grooves formed in said inner face, and a plug adapted to have the inner circulating-tube attached thereto and provided with a face adapted to bear against the conical seat in the outer tube or lantern and provided with a projection or projections adapted to enter the spiral groove or grooves of the outer tube or lantern.

3. In Niclausse and similar water-tube boilers, the combination of an outer tube or lantern provided at its forward end with a seat

for the lantern-plug and having a spiral groove or grooves formed therein, and a plug adapted to have the inner circulating-tube attached thereto and provided with a face adapted to bear against the seat in the outer tube or lantern and provided with a groove or recess in its rear end face, thus leaving an annular wall or shell around the same, said plug being provided with a projection or projections adapted to enter the spiral groove or grooves in the outer tube or lantern.

4. In Niclausse and similar water-tube boilers, the combination of a lantern adapted to have an outer tube attached to its rear end and provided at its forward end with a collar having a seat for the lantern-plug and having a spiral groove or grooves formed therein, and a plug adapted to have the inner circulating-tube attached thereto and provided with a face adapted to bear against the seat in the lantern, and having a projection or projections adapted to enter the spiral groove or grooves of the lantern.

5. In Niclausse and similar water-tube boilers, the combination of a lantern adapted to have the outer tube attached to its rear end and provided at its forward end with a collar having a conical seat formed on its inner face and having a spiral groove or grooves formed in said face in advance of said seat, and a plug adapted to have the inner circulating-tube attached thereto and provided with a face adapted to bear against the conical seat in the lantern and having a projection or projections adapted to enter the spiral groove or grooves in the lantern.

6. A lantern for Niclausse and similar water-tube boilers, comprising a skeleton frame provided with a conical seat on its outer face at the forward end and having a spiral groove or grooves in said inner face in advance of the conical seat.

7. A lantern-plug for Niclausse and similar water-tube boilers comprising a circular body having a smooth peripheral face and adapted to have the inner tube connected to its rear end and provided with one or more radially-extending projections in front of the smooth peripheral face.

In testimony whereof I, the said JAMES P. SNEDDON, have hereunto set my hand.

JAMES P. SNEDDON.

Witnesses:
E. E. BAKER,
RENICK M. BELL.